

AMENDMENTS

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Please amend the above-referenced application as follows:

AUG 22 2001

IN THE CLAIMS

Technology Center 2600

Please amend independent claims 1, 11, and 18 as follows:

SAC
DJ

1. (Twice Amended) An apparatus for occlusion testing primitives being processed in a graphics system, each primitive having a minimum Z value and a maximum Z value, the apparatus comprising:

logic configured to create a Z pyramid data structure, the Z pyramid data structure comprising at least first and second levels, each level comprising a plurality of regions, each region comprising a plurality of subregions, each subregion corresponding to a single Z value, each region corresponding to a plurality of Z values and having a maximum region Z value corresponding to the greatest of the Z values of the region, wherein each subregion in the second level has a Z value that corresponds to a maximum Z value of a plurality of subregions in the first level, said logic comparing the minimum Z value of each primitive with the Z value of a region associated with the tested primitive to determine whether the tested primitive is fully occluded, wherein when the tested primitive is not fully occluded, said logic determines whether any subregion of the region associated with the tested primitive is fully covered by the primitive, wherein when a subregion is fully covered by the tested primitive, then said logic determines whether the Z value of the covered subregion needs to be replaced with the maximum Z value of the tested primitive, wherein said logic to determines whether the Z value of the covered subregion needs to be replaced with the maximum Z value of the tested primitive by determining whether the maximum Z value of the tested primitive is less than the Z value for the covered subregion, wherein when the maximum Z value of the primitive is less than the Z value for the covered subregion, then the Z value for the covered subregion is replaced with the maximum Z value of the primitive as primitives are being processed through the graphics system.

DJ CM

11. (Twice Amended) A method for occlusion testing primitives in a graphics system, each primitive having a minimum Z value and a maximum Z value, the method comprising the steps of:

generating a Z pyramid data structure, the Z pyramid data structure comprising at least first and second levels, each level comprising a plurality of regions, each region comprising a plurality of subregions, each subregion corresponding to a single Z value, each region corresponding to a plurality of Z values and having a maximum region Z value corresponding to the greatest of the Z values of the region, wherein each subregion in the second level has a Z value that corresponds to a maximum Z value of a plurality of subregions in the first level;

comparing the minimum Z value of each primitive with the Z value of a region associated with the tested primitive to determine whether the tested primitive is fully occluded;

when the tested primitive is not fully occluded, determining whether or not any subregion of the region associated with the tested primitive is fully covered by the primitive;

when a subregion is fully covered by the tested primitive, determining whether or not the Z value of the covered subregion needs to be replaced with the maximum Z value of the tested primitive by determining whether or not the maximum Z value of the tested primitive is less than the Z value for the covered subregion; and

when the maximum Z value of the primitive is less than the Z value for the covered subregion, replacing the Z value for the subregion with the maximum Z value of the primitive as primitives are being processed through the graphics system.

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Comments

18. (Twice Amended) An apparatus for occlusion testing primitives being processed in a graphics system, each primitive having a minimum Z value and a maximum Z value, the apparatus comprising:

means for creating a Z pyramid data structure, the Z pyramid data structure comprising at least first and second levels, each level comprising a plurality of regions, each region comprising a plurality of subregions, each subregion corresponding to a single Z value, each region corresponding to a plurality of Z values and having a maximum region Z value corresponding to the greatest of the Z values of the region, wherein each subregion in the second level has a Z value that corresponds to a maximum Z value of a plurality of subregions in the first level; and

means for comparing the minimum Z value of each primitive with the Z value of a region associated with the tested primitive to determine whether the tested primitive is fully occluded, wherein if a determination is made that the tested primitive is not fully occluded, said comparing means determines whether any subregion of the region associated with the tested primitive is fully covered by the primitive, wherein when that a subregion is fully covered by the tested primitive, then said comparing means determines whether the Z value of the covered subregion needs to be replaced with the maximum Z value of the tested primitive by determining whether the maximum Z value of the tested primitive is less than the Z value for the covered subregion, wherein when said comparing means determines that the maximum Z value of the primitive is less than the Z value for the covered subregion, then said comparing means replaces the Z value for the subregion with the maximum Z value of the primitive as primitives are being processed through the graphics system.